Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (original) A method for controlling a flow of a non-solid substance in a Variable Temperature Control (VTC) box in a temperature control system, wherein the VTC box comprises a heat exchange device under control of a regulation device, comprising: receiving an indication of a temperature setpoint; measuring a discharge air temperature of the VTC box and calculating an error between the temperature setpoint and the measured discharge air temperature; and until a new temperature setpoint indication is received, repeating the steps comprising: based on the error, predicting a regulation device position adjustment to actuate the regulation device to achieve the temperature setpoint, if the predicted regulation device position adjustment is less than a minimum position adjustment, not actuating the regulation device and measuring the discharge air temperature to calculate an average discharge air temperature over a period of time, if the predicted regulation device position adjustment is not less than the minimum position adjustment, measuring the discharge air temperature in the VTC box while actuating the regulation device the predicted position adjustment or until the discharge air temperature is measured to have crossed the temperature setpoint, in response to actuating the regulation device, measuring the discharge air temperature to calculate the average discharge air temperature, and based on the average discharge air temperature, recalculating the error.

2. (original) A computer-readable medium having stored thereon computer-executable instructions for performing the method of claim 1.

3. (original) The method of claim 1, wherein the predicted position adjustment is determined by dividing the error by a slope of a regulation device response curve.

4. (original) The method of claim 3, further comprising: in response to actuating the regulation device and calculating the average discharge air temperature, determining how much the

regulation device was adjusted and calculating a new slope of the regulation device response curve; in response to determining that the regulation device was adjusted less than a second minimum position adjustment, disregarding the new slope and using the previous slope to recalculate the error; in response to determining that the regulation device was adjusted within a predetermined position adjustment range, averaging the new slope with the previous slope and using the averaged slope to recalculate the error; and in response to determining that the regulation device was adjusted more than the predetermined position adjustment range, using the new slope to recalculate the error.

5. (original) A computer-readable medium having stored thereon computer-executable instructions for performing the method of claim 4.

6. (original) The method of claim 1, wherein actuating the regulation device the predicted regulation device position adjustment or until the discharge air temperature is measured to have crossed the temperature setpoint comprises: in response to determining that the predicted regulation device position adjustment is not greater than a second minimum position adjustment, actuating the regulation device the predicted position adjustment; and in response to determining that the predicted regulation device position adjustment is greater than the second minimum position adjustment, actuating the regulation device until the discharge air temperature is measured to have crossed the temperature setpoint.

7. (original) The method of claim 1, further comprising, in response to receiving the temperature setpoint indication, calculating a percent change between the temperature setpoint and a previous temperature setpoint; and in response to determining that the percent change is greater than a predetermined percent change, replacing the previous temperature setpoint with the temperature setpoint.

8. (original) A Variable Temperature Control (VTC) temperature control system comprising: a VTC box including a heat exchange device and a discharge air temperature sensor for measuring the discharge air temperature; a flow regulation device for controlling a volume of non-solid substance delivered to the heat exchange device; and a micro-controller configured for executing

computer-executable instructions for: receiving a discharge temperature setpoint, receiving a discharge air temperature measurement from the temperature sensor and calculating an error between the discharge temperature setpoint and the discharge air temperature measurement, and until a new discharge temperature setpoint is received, repeating the steps comprising: based on the error, predicting a flow regulation device position adjustment to actuate the flow regulation device in the VTC box to achieve the temperature setpoint, if the predicted flow regulation device position adjustment is less than a minimum position adjustment, not generating a signal for actuating the flow regulation device and receiving discharge air temperature measurements from the discharge air temperature sensor to calculate an average temperature over a period of time, if the predicted flow regulation device position adjustment is not less than the minimum position adjustment, receiving discharge air temperature measurements from the discharge air temperature sensor while generating the signal for actuating the flow regulation device the predicted flow regulation device position adjustment or until one of the temperature measurements is determined to have crossed the temperature setpoint, in response to actuation of the flow regulation device, receiving discharge air temperature measurements from the discharge air temperature sensor to calculate the average temperature, and based on the average discharge air temperature, recalculating the error.

9. (original) The system of claim 8, wherein the predicted flow regulation device position adjustment is determined by dividing the error by a slope of a flow regulation device response curve.

10. (original) The system of claim 9, wherein the micro-controller further executes computer-executable instructions comprising: in response to actuation of the flow regulation device and calculation of the average discharge air temperature, determining how much the flow regulation device was actuated and calculating a new slope of the flow regulation device response curve; in response to determining that the flow regulation device was actuated less than a second minimum position adjustment, disregarding the new slope and using the previous slope to recalculate the error; in response to determining that the flow regulation device was actuated within a predetermined position adjustment range, averaging the new slope with the previous slope and using the averaged slope to recalculate the error; and in response to determining that

the flow regulation device was actuated more than the predetermined position adjustment range, using the new slope to recalculate the error.

11. (original) The system of claim 8, wherein generating the signal for actuating the flow regulation device the predicted flow regulation device position adjustment or until the discharge air temperature is measured to have crossed the temperature setpoint comprises: in response to determining that the predicted flow regulation device position adjustment is not greater than a second minimum position adjustment, generating the signal for actuating the flow regulation device the predicted position adjustment; and in response to determining that the predicted flow regulation device position adjustment is greater than the second minimum position adjustment, generating the signal for actuating the flow regulation device until the airflow is measured to have crossed the airflow setpoint.

12. (original) The system of claim 8, wherein the micro-controller further executes computer-executable instructions comprising: in response to calculating the temperature setpoint, calculating a percent change between the temperature setpoint and a previous temperature setpoint; and in response to determining that the percent change is greater than a predetermined percent change, replacing the previous temperature setpoint with the temperature setpoint.

13. (original) A method for controlling a Variable Temperature Control (VTC) box in a temperature control system, wherein the VTC box comprises a heat exchange device under control of a regulation device, comprising: receiving an indication of a temperature setpoint; measuring a discharge air temperature of the VTC box and calculating an error between the temperature setpoint and the measured discharge air temperature; and until a new temperature setpoint indication is received, repeating the steps comprising: based on the error, predicting a regulation device setting to which the regulation device is actuated to achieve the temperature setpoint, if the predicted regulation device setting requires less than a minimum setting change, not actuating the regulation device and measuring the discharge air temperature to calculate an average discharge air temperature over a period of time, if the predicted regulation device setting does not require less than the minimum setting change, measuring the discharge air temperature in the VTC box while actuating the regulation device to the predicted regulation device setting or

until the discharge air temperature is measured to have crossed the temperature setpoint, in response to actuating the regulation device, measuring the discharge air temperature to calculate the average discharge air temperature, and based on the average discharge air temperature, recalculating the error.

14. (original) A computer-readable medium having stored thereon computer-executable instructions for performing the method of claim 13.

15. (withdrawn) A new method for implementing PID control having a proportional term, an integral term, and a derivative term, the method comprising: receiving a controlled variable measurement and calculating an error between the controlled variable measurement and a desired condition; defining at least two distinct regions of operation based at least in part on the error, wherein each region has a predetermined gain set; based on the error, (i) determining a region of operation, (ii) calculating a PID output using a gain set associated with that region; after the expiration of a time increment, re-measuring the controlled variable, re-calculating the error and repeating steps (i)-(iii).

16. (withdrawn) A method of claim 15, wherein at least one gain set comprises significantly increasing the PID output and accumulating the integral term at an accelerated rate.

17. (withdrawn) A method of claim 15, wherein at least one gain set comprises updating the proportional term but not updating the integral term.

18. (withdrawn) A method of claim 16, wherein at least one gain set comprises updating the proportional term and the integral term.

19. (withdrawn) A method of claim 15, wherein at least one gain set increments the integral term at a fixed rate not varying with the error.

20. (withdrawn) A method of claim 15, wherein at least one gain set implements derivative control action by enabling or disabling the integral action.